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The Development of Productive Knowledge of Vocabulary through Implicit Exposure: Non-lexicalized Words in Focus

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Abstract
The researcher aimed at investigating the possible effects of first language-second language (L1-L2) lexicalization mismatch on the acquisition and retention of productive vocabulary knowledge. Non-lexicalized words were operationally defined as the L2 words lacking a lexically-equivalent translation in learners' L1 (i.e. Persian). In other words, non-lexicalized words referred to those L2 words that required a longer string of L1 words to cover their essential semantic features. Ninety Persian-speaking EFL learners were exposed to 10 target words incidentally. Subsequently, they sat for a test of productive vocabulary knowledge immediately and after three weeks of delay. The results revealed that there were significant differences between lexicalized and non-lexicalized target words in the productive knowledge of associations. Therefore, it might be the case that non-lexicalized words were most likely to cause extra difficulty for EFL learners in the semantic aspects of vocabulary knowledge. Input enrichment and explicit instruction within a systematic vocabulary recycling program were recommended to acquire such words.
Keywords: productive vocabulary knowledge, incidental acquisition, non-lexicalized words, translation equivalence.

INTRODUCTION

Vocabulary knowledge (or lexical competence) in L2 acquisition has received much more attention in recent years as a fruitful area of investigation (Hairrell, Rupley & Simmons, 2011; Meara, 2012). There is a growing consensus among SLA researchers that total language proficiency incorporates more than just grammatical competence or the traditional skills of reading, writing, listening and speaking to the effect that vocabulary knowledge is recognized as a core component of linguistic and communicative competence (Heidari-Shahreza, Moinzadeh, & Barati, 2014 a; Nation, 2013 to name a few). Scholars tend to view vocabulary knowledge as a multifaceted construct encompassing a range of interrelated sub-knowledges such as knowledge of orthography, parts of speech and knowledge of meaning and associations (see for

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example, Webb, 2007). Alternatively, some define vocabulary knowledge (or lexical knowledge) in terms of binary distinctions such as vocabulary breadth (or size) and depth, referring to the number of words learners know and how well they know them respectively (Heidari-Shahreza, Moinzadeh, & Barati, 2014 b; Webb, 2013). Likewise, Nation (2001) holds the view that knowledge of vocabulary consists of receptive and productive sub-knowledges in three main domains of form, meaning and vocabulary use. His view implies that knowing a word entails knowing its primary and secondary meanings (i.e., denotations and connotations of a word including associations with other words), spelling and syntactic functions (see also, Kieffer & lesaux, 2012). Within the perspective of vocabulary acquisition, both intentional (explicit) and incidental (implicit) approaches have been proposed and practiced (Rott, 2013). Despite ongoing debates on the way and the extent either approach should be implemented and their overall effectiveness, it is generally agreed that incidental vocabulary acquisition that is learning new L2 words while reading texts remains an important means of vocabulary development and reinforcement (Chen & Truscott, 2010; Hairrell et al., 2011; Rott, 2013; Webb, 2007). Reading (or written input) provides a rich context through which learners can acquire and complement different aspects of vocabulary knowledge, contributing to lexical competence both at the recognition level (receptive knowledge) and production level, productive knowledge (Heidari-Shahreza & Tavakoli, 2012).

Non-lexicalized words

Lexicalization is defined as how a language molds different concepts into words or lexical items (Heidari-Shahreza & Tavakoli, 2012; Paribakht, 2005). The point here is languages may have different ways of lexicalizing the same concept (Paribakht, 2005; Chen & Truscott, 2010). L1 lexicalization indicates the way learners' L1 lexicalizes different concepts that might be different from that of their second or foreign language (Chen & Truscott, 2010). In this regard, L1-L2 lexicalization mismatch addresses the question of whether or not L2 target words have the same translation in learners' L1 (e.g., Persian). Therefore, the L2 words which have a lexically equivalent translation are called 'lexicalized' while those words that need to be translated with a long string of words to cover their essential semantic components are named 'non-lexicalized' (Chen & Truscott, 2010; Heidari-Shahreza et al. 2014 a, b). The word 'brunch' in English, for example, does not have an equivalent translation in Persian and has to be paraphrased in *several* words as "غذایی که هم به جای ناشتا هم ناهار صرف شود" (a late morning meal eaten instead of breakfast and lunch). Therefore, for Persian-speaking EFL learners, the word 'brunch' is considered a non-lexicalized (NL, hereafter) word. Whereas the word 'book', for example, is easily lexicalized into one single Persian word, 'کتاب'. Hence, it falls into the category of lexicalized (L, hereafter) English words with respect to Persian.

REASERCH ON NL WORDS

Among the few studies with a special focus on NL words is Paribakht's (2005) seminal study in which she investigated the relationship between L1-L2 (i.e. Persian and

English) lexicalization process and the inferencing behavior of 20 Persian-speaking learners while reading English passages. The findings revealed that while the participants made use of the same knowledge resources in inferencing both L and NL words, they had more difficulty in decoding NL words. Paribakht concluded that L1-L2 lexicalization mismatch might be to the detriment of learners' L2 reading comprehension and vocabulary development. Her study, however, did not explore how L and NL words were different in the acquisition and retention of different aspects of vocabulary knowledge.

To bridge this gap, Chen and Truscott (2010) using a modified version of Webb's taxonomy of vocabulary knowledge (2007), explored the incidental vocabulary acquisition and retention of 10 target words by 72 university students. They found that NL words could cause learning difficulty both immediately and after two weeks. It was further suggested that even an increase in exposure frequency up to seven encounters could contribute little to significant learning of NL words since, in their view, these words were "too difficult to learn from even seven encounters ". Their study, however, was limited in that, among other things, the position of the target words in the reading passages, their saliency and informativeness were not fully controlled.

Based on this study, Heidari-Shahreza and Tavakoli (2012) further investigated the same issue on 90 Iranian EFL learners using 10 English target words. They concluded that NL words caused learning difficulty mainly in semantic aspects of vocabulary knowledge such as knowledge of meaning and associations. However, despite some improvements over Chen and Truscott's study, their study did not control for the potential cultural connotations of the target words.

Recently, Heidari-Shahreza et al. (2014a, b) in a series of studies investigated the acquisition and retention of L and NL words in relation to a number of factors such as exposure frequency and cultural loadedness employing Iranian EFL learners as their participants. The findings, in general, indicated that NL words could cause extra difficulty for EFL learners in the semantic aspects of vocabulary knowledge.

THIS STUDY

As the small number of studies on L1 Lexicalization in relation to vocabulary acquisition and the intricacy involved in the acquisition and retention of NL words implies, further research on this factor is needed. Hence, this study, through a quasi-experimental design investigated the incidental acquisition and retention of L and NL vocabulary by 90 Persian-speaking EFL learners. Furthermore, the researcher would like to know how any observed gains in learners' productive knowledge were retained over a period of three weeks. Thus, retention is also taken into account by a delayed posttest. This study is part of a much larger project exploring, number of exposure frequency, L1 lexicalization and cultural loadedness.

The present study tried to answer three research questions:

1. Did the acquisition of non-lexicalized TWs differ from the ones that were lexicalized in EFL learners' L1 (i.e. Persian)?
2. If so, which aspects of productive vocabulary knowledge were more involved?
3. Was there any significant difference between lexicalized and non-lexicalized TWs in terms of retention after three weeks?

Participants

The population, out of whom the final participants were selected, were Iranian adult EFL learners. A call on voluntary participation was announced and 128 students expressed their interest to participate. They, then, took Oxford Placement Test (OPT) out of which 111 were identified as intermediate. Afterwards, the Vocabulary Levels Test (Nation, 1990), a widely-used size test and an appropriate measurement instrument for vocabulary knowledge was given (Laufer, & Goldstein, 2004). All participants scored 25 or more (out of 30) on 2000 level of the Vocabulary Level Test, with an average score of 28.2. As the third stage, the participants filled a sociolinguistic background survey through which it was assured that the final participants, among other things, had the same first language and amount of exposure to English. Due to a significantly different performance on the Levels test or their linguistic background, a few participants were excluded from the scope of thus study. Finally, 90 participants were deemed as sufficiently appropriate for this study. They were then, equally divided into three groups of participants, based on the number of encounters to TWs (i.e. E1, E3, and E7).

Materials and Instruments

Target words (TWs)

There were 10 target words (TWs, hereafter) which were equally classified into two groups: Lexicalized (L) and Non-lexicalized (NL).

They all together included four verbs, four nouns and two adjectives (see Table 1). To select the TWs, the researcher decided to prepare a small corpus of lexicalized and non-lexicalized words. In so doing, after a call on participation, 40 university students who were native speakers of Persian and fluent in English volunteered to note down the appropriate words they encountered over a six-month period of reading English texts. Before embarking on that, the researcher held several meetings with them, to define and provide examples for L and NL words. Over these 6 months, three more meetings were held to make sure they were all on the right track. The assistants were also kindly asked to check their initial guess regarding the suitability of a word against well-established English as well as Persian dictionaries and ask other native speakers, if necessary. All collected words were also accompanied by one example of its use in an

authentic context. As the outcome of this cooperation, more than 1500 words were gathered (mainly verbs, nouns, adjectives and few adverbs). The researchers checked these words once more that resulted in excluding a few ones. Afterwards, based on the difficulty level, conceptual familiarity and word frequency, 10 words were deemed as final TWs. It is worth noting that selected TWs were assured to be unknown to all the participants at the time of the study, based on a checklist.

Table1. Selected target words

Lexicalized(L)	Non-lexicalized (NL)
explain (v)	elope (v)
flee (v)	giggle (v)
annoyance (n)	lounge (n)
masterpiece (n)	brunch (n)
stubborn (adj)	smoggy (adj)

Reading passages

On the whole, the participants read 13 reading passages. These passages were of two types: Main reading passages (M) which each contained all 10 TWs once and distracter passages (D) which despite the same length (more or less 250 words) and difficulty level, did not contain any of TWs. Based on the design of the study (i.e. one, three or seven encounters to TWs), seven main passages were composed by the researcher and two native English teachers. The other six remaining distracter passages were taken from a reading textbook at intermediate level (Kirn& Hartmann, 2002) only for the participants to read the same number of reading passages regardless of which experimental group (i.e. E1, E3 or E7) they were in (see Table 2).

Table 2. Distribution of reading passages

Group	**Distribution of Main and Distracter passages**							**exposure**
E1	D_1	D_2	D_3	D_4	D_5	D_6	M_7	**1**
E3	M_1	D_2	D_3	M_4	D_5	D_6	M_7	**3**
E7	M_1	M_2	M_3	M_4	M_5	M_6	M_7	**7**

Vocabulary post-test

To have a better picture of the learners' vocabulary knowledge after exposing to TWs, as in Chen and Truscott's (2010) study, a modified version of Webb's (2007) test of vocabulary knowledge was used. The multifaceted focus of this test allowed for assessing different aspects of productive vocabulary knowledge (see Table 3).

Table3. Types of productive vocabulary knowledge &respective sub-tests

No.	Knowledge measured	Test type
1	Productive Knowledge of Orthographic Form (PO)	Dictation
2	Productive Knowledge of Parts of Speech (PP)	Sentence construction
3	Productive Knowledge of Associations (PA)	Pragmatic association

Sub-test 1. Productive Knowledge of Orthographic Form (PO)

To assess this aspect of vocabulary knowledge, a dictation test was used. The researchers played a recording of TWs by a native English speaker twice. The participants had 20 seconds to write each TW down. Since partial success in orthography can be attributed to phonological prompts rather than the treatment (Chen & Truscott 2010; Webb 2007), any error in spelling whatsoever resulted in the item being marked as incorrect.

Sub-test 2. Productive Knowledge of Parts of Speech (PP)

To measure the productive knowledge of parts of speech, the learners were asked to use the TWs in English sentences. Their sentences were considered as correct if the TWs were used in the grammatical functions they were expected. For example, the TW, 'lounge' needed to be a 'noun' in a given sentence to be scored as correct.

Sub-test 3. Productive Knowledge of Associations (PA)

As the title of the test suggests, here, the test-takers had to provide a word pragmatically associated with the TWs. Therefore, for the TW, 'lounge', for instance, an answer such as ‘room’ was correct. What is more, the participants were told not to produce grammatical associations.

Data collection

Phase 1: Reading passages

As mentioned above, there were 13 reading passages (seven main and six distracter texts). However, each group was to read only seven passages. Based on the design of the study, the first six reading passages in group E1were distracters. Therefore, they only read one main passage containing the TWs. Group E3 read three main and four distracter passages hence they had three encounters to the TWs. Unlike E1 and E3, group E7 did not read any of the distracters. That is, they read all seven main reading passages. Therefore, they had seven encounters to the TWs. It is worth noting that the seventh passage in all groups was a main passage and thus contained the TWs. Being so, all the participants had finished the reading phase an encounter to the TWs. This, in turn, blocked the effect of how recently they had seen the TWs.

Phase 2: Immediate post-test

Upon having read the passages, the participants sat for the vocabulary post-test outlined above. Although the participants did not expect a vocabulary post-test, they were willing enough to take it. Each subtest was printed on a single page and the participants were told not to look back to the preceding subtests. There was no time limit on the submission of the answer sheets. Yet, the test-takers finished the test within an acceptable time range.

Phase 3: Delayed post-test

To check participants' retention of any gained vocabulary knowledge from reading the passages, the participants again, take the vocabulary post-test after three weeks. There was no sample attrition and the test proceeded following the same procedure as the immediate post-test. In addition, as far as feasible, the participants' exposure to English usually via learning tasks or reading materials were generally considered by the researchers during these three weeks to control for any significant effect on their vocabulary knowledge.

Data analysis

To analyze the scores obtained from the participants in the three experimental groups (i.e. E1, E3 and E7) ANOVA and its non-parametric version Kruskal-Wallis were employed whenever normality requirement was not met. Moreover, Post *hoc* Tukey and Least Significance Difference (LSD) tests were used to discern significant effects (at $p < .05$). The same statistical procedure was run for the results obtained from the delayed posttest. In the next section, the results are presented in details.

RESULTS

Effects of L1 lexicalization in the immediate post-test

Based on the analyses of mean score differences between the groups, there was a significant difference only for group E7 on the Productive Knowledge of Associations (PA) test. These cases aside, no statistically significant differences between L and NL word scores were observed (see Table 4).

Table4. Comparison between L and NL words in the immediate post-test

Group	E1	E3	E7
Sub-test	L vs. NL	L vs. NL	L vs. NL
Productive Knowledge of Orthographic Form	0.243	0.465	0.402
Productive Knowledge of Parts of Speech	0.453	0.541	0.218
Productive Knowledge of Associations	0.279	0.468	0.003*

Note: *= $p < .05$; L: Lexicalized; NL: Non-lexicalized

Effects of L1 lexicalization in the delayed post-test

Based on the same statistical procedure, the mean scores for L and NL words were analyzed to discern how a three-week delay could make a difference in the observed results for the immediate post-test. As shown in Table5, the same significant differences were observed again in the delayed vocabulary post-test. The only exception was the PA test for group E7 where no significant difference for L and NL words on the delayed post-test was reached.

Table5. Comparison between L and NL words in the delayed post-test

Group	E1	E3	E7
Sub-test	L vs. NL	L vs. NL	L vs. NL
Productive Knowledge of Orthographic Form	0.530	0.223	0.489
Productive Knowledge of Parts of Speech	0.587	0.876	0.323
Productive Knowledge of Associations	0.119	0.273	0.334

Note: *= $p < .05$; L: Lexicalized; NL: Non-lexicalized

DISCUSSION

The primary purpose of the present study was to investigate the acquisition and retention of productive knowledge of vocabulary. Simply put, the study aimed at discerning how the acquisition and retention of non-lexicalized (NL) words would differ from lexicalized (L) words with respect to different aspects of vocabulary knowledge. A fundamental question of this study was whether or not NL words could possibly cause learning difficulty for EFL learners. In this regard, the findings of the study generally indicates that the main difference between L and NL words lies in the semantic aspects of vocabulary knowledge (as also concluded by Heidari-Shahreza & Tavakoli, 2012; Heidari-Shahreza et al. 2014 b). That is to say, there were significant differences in the mean scores obtained by the participants for NL words in comparison with their L counterparts on the semantic subtests of productive knowledge of associations (PA) in the immediate posttest after seven encounters (i.e. E7). A complication to this general pattern of the semantic tests is that while the mean score differences between the two sets of vocabulary reached significance after seven encounters on PA test, in the delayed posttest (i.e. after three weeks), it was not the case with the this test. A possible explanation for this difference might be that PA test entailed mastery at production level not merely recognition. Furthermore, as Webb (2007) points out the receptive measure of vocabulary knowledge are slower to respond to "small gains of knowledge".

Another important question here is why significant differences were observed on the semantic aspects of vocabulary knowledge (i.e. association). While certainly further research is needed, it might be due to the active role of L1 in L2 lexical inferencing and meaning construction. The literature in this regard, suggests that the initial form-

meaning linkage of an L2 word is mediated by the learners' L1 lexicon (Barcroft, 2002). That is, a new L2 form is initially attached to an already existing meaning in the learners' L1-based mental lexicon. During the process of lexical inferencing from a text, cognitively speaking, EFL learners seek for the best match in their mental lexicon for the new L2 word, based on the cues extracted from the context (see Jiang, 2004). As for an L word, the lexical equivalent is readily retrieved from a learner's L1-based lexicon since it is already existing as a 'lemma package' (as Paribakht, 2005 calls it). However, the process of lexical matching (or L1-L2 mental translation, so to speak) is deterred for an NL word because there is no existing or largely overlapping lemma (i.e. an appropriate match) for it in the mental lexicon. Therefore, given that EFL learners can extract the semantic features of an NL word from the surrounding text, they may not be able to fully acquire the meaning of that word since an NL word cannot trigger a corresponding lemma in the mental lexicon (Heidari-Shahreza et al., 2014 c; Paribakht, 2005). Therefore, it seems plausible why the participants were particularly less successful in the semantic aspects of vocabulary knowledge in acquiring NL words.

CONCLUSION

As the primary aim of this study, the researcher was particularly interested to explore the acquisition and retention of productive knowledge of L and NL words. L words, in essence, represented a large number of English words that could be easily translated to (or replaced with) their equivalents in the learners' L1 (here, Persian) with the same number of lexical items. NL words which were in fact a marked portion of L2 vocabulary, referred to those L2 words that required a longer string of L1 words to cover their essential semantic features. Based on this definition, the study focused on the acquisition and retention of 10 TWs (including L and NL words) through reading English texts by 90 Iranian adult EFL learners. The findings generally indicated that there were significant differences between L and NL words in the productive knowledge of associations (PA). These differences in the PA were most apparent when the participants had seven encounters to the TWs. As for the other aspects of vocabulary knowledge, this study did not bear any significant results.

The present study was limited in a number of ways. Firstly, it made use of a limited number of target words. The participants of the study were also only adult EFL learners of one Iranian university. The findings could be more generalizable if a larger bulk of target words with a more representative sample of participants including different age groups and proficiency levels were employed. Therefore, besides alleviating such shortcomings, the interested researchers may follow this line of research by investigating longer periods of vocabulary retention. Furthermore, adding qualitative measure of vocabulary knowledge helps the internal validity of research. Finally, there are other marked portions of vocabulary such as culturally-loaded words or collocations which as in NL words may be an area of problem for EFL learners. Hence, it would also be interesting to expand the scope of this study by taking such words into account.

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